



Chapter Seven

Financial Analysis and Constraint





Financial Analysis

The BCATS 2040 Metropolitan Transportation Plan is a composition of the significant transportation system improvements scheduled for implementation in the urbanized area during the next 29 year time frame and updated every five years. The purpose of the Plan is defined by the rules put forth in 23 CFR Part 450 which require state and local governments develop a Plan that is financially constrained and includes a financial plan that demonstrates which projects can be implemented using current revenue sources and which projects are to be implemented using proposed revenue sources, while the existing transportation system is being adequately operated and maintained. A financially constrained Plan will be more meaningful for elected officials and citizens. Once the Plan is financially constrained, it will remove all wishful or unbuildable projects from the documents, thus removing false hope. In other words, Federally-funded expenditures are required by federal law to be consistent with the Metropolitan Transportation Plan and to be constrained to include only projects that we anticipate having enough revenue to complete.

Local Agencies Revenue Estimates

Table 1: Local Agencies Revenue Estimates

Estimates as of 4/10/2012	BCATS STUL Funds (Federal \$)	BCRC Urban Area (Bay City) Act 51 - Primary	Bay City Act 51 - Major	Essexville Act 51 - Major	Total \$ for Local Federal Aid Eligible Roads	Total Funds for Capital Improvement Projects*
2011 Funding	\$1,388,148	\$821,383	\$1,836,589	\$159,805	\$4,205,926	\$2,233,481
Lane miles	298	196	93	9	298	298
2012	\$1,388,148	\$821,383	\$1,836,589	\$159,805	\$4,205,926	\$1,933,481
2013	\$1,388,148	\$821,383	\$1,836,589	\$159,805	\$4,205,926	\$1,933,481
2014	\$1,415,911	\$837,811	\$1,873,321	\$163,002	\$4,290,044	\$1,978,151
2015	\$1,444,229	\$854,567	\$1,910,787	\$166,262	\$4,375,845	\$2,023,714
2016	\$1,473,114	\$871,659	\$1,949,003	\$169,587	\$4,463,362	\$2,070,188
2017	\$1,502,576	\$889,092	\$1,987,983	\$172,979	\$4,552,629	\$2,117,592
2018	\$1,541,944	\$912,386	\$2,040,068	\$177,511	\$4,671,908	\$2,180,933
2019	\$1,582,342	\$936,290	\$2,093,518	\$182,161	\$4,794,312	\$2,245,933
2020	\$1,623,800	\$960,821	\$2,148,368	\$186,934	\$4,919,923	\$2,312,637
2021	\$1,666,343	\$985,995	\$2,204,655	\$191,832	\$5,048,825	\$2,381,088
2022	\$1,710,002	\$1,011,828	\$2,262,417	\$196,858	\$5,181,104	\$2,451,332
2023	\$1,754,804	\$1,038,338	\$2,321,692	\$202,015	\$5,316,849	\$2,523,417
2024	\$1,800,779	\$1,065,542	\$2,382,521	\$207,308	\$5,456,150	\$2,597,391
2025	\$1,847,960	\$1,093,459	\$2,444,943	\$212,740	\$5,599,102	\$2,673,302
2026	\$1,896,376	\$1,122,108	\$2,509,000	\$218,313	\$5,745,798	\$2,751,203
2027	\$1,946,062	\$1,151,507	\$2,574,736	\$224,033	\$5,896,338	\$2,831,144
2028	\$1,997,048	\$1,181,677	\$2,642,194	\$229,903	\$6,050,822	\$2,913,180
2029	\$2,049,371	\$1,212,637	\$2,711,420	\$235,926	\$6,209,354	\$2,997,366
2030	\$2,103,065	\$1,244,408	\$2,782,459	\$242,108	\$6,372,039	\$3,083,757
2031	\$2,158,165	\$1,277,011	\$2,855,359	\$248,451	\$6,538,986	\$3,172,411
2032	\$2,214,709	\$1,310,469	\$2,930,170	\$254,960	\$6,710,308	\$3,263,388
2033	\$2,272,734	\$1,344,803	\$3,006,940	\$261,640	\$6,886,118	\$3,356,749
2034	\$2,332,280	\$1,380,037	\$3,085,722	\$268,495	\$7,066,534	\$3,452,556
2035	\$2,393,385	\$1,416,194	\$3,166,568	\$275,530	\$7,251,677	\$3,550,873
2036	\$2,456,092	\$1,453,298	\$3,249,532	\$282,749	\$7,441,671	\$3,651,766
2037	\$2,520,442	\$1,491,375	\$3,334,670	\$290,157	\$7,636,643	\$3,755,302
2038	\$2,586,477	\$1,530,449	\$3,422,038	\$297,759	\$7,836,723	\$3,861,551
2039	\$2,654,243	\$1,570,546	\$3,511,695	\$305,560	\$8,042,045	\$3,970,584
2040	\$2,723,784	\$1,611,695	\$3,603,702	\$313,566	\$8,252,747	\$4,082,473
Total	\$56,444,333	\$33,398,769	\$74,678,65	\$6,497,94	\$171,019,704	\$82,116,944
*Includes 30% of total Act 51 funds less \$1,000,000 for two Bay City Bascule Bridges						
Estimates are based on 2011 and are flat for '12 and '13, 2% annual increase from '14 to '17, and 2.62% increase thereafter						



The table on the previous page, [table one](#), shows the yearly estimates of future revenue for the BCATS road agencies, excluding MDOT, for Act 51 funds dedicated for urban areas and the Surface Transportation Funds received by BCATS for local agency transportation projects, the two primary sources of revenue for road projects within the BCATS. Future estimates are based on the 2011 funding levels. No growth in revenues is expected for 2012 and 2013. Starting in 2014 a 2% increase is estimated through 2017. After 2017, the estimated yearly increase is 2.62%, bringing the 29 year total for all the BCATS local agencies to \$171 million.

Of that \$171 million, nearly 70% is used for routine maintenance and operations which includes snow and ice removal, administration, mowing, road patching, and equipment. It excludes any capital improvement projects that will extend the life on the road such as crack sealing, chip and seal, resurfacing, and reconstruction. The amount that is left available for capital improvement from 2012 to 2040 totals \$82 million, averaging \$2.8 million per year between the Bay County Road Commission (BCRC), Bay City and Essexville to maintain 298 lane miles of roads.

Table 2: Local Agency Fiscal Constraint Demonstration		Dollars (x1000)
Total Local Road Agency Available Funds		\$171,020
Operations and Maintenance Cost	-	\$88,903
Funds Available for Capital Projects		\$82,117
Metropolitan Transportation Plan Identified Projects	-	\$30,534
Available for unassigned Preservation and Maintenance Projects		\$51,583

Table two (above) compares the local agency roads projects listed in [Chapter 5](#) with the estimated revenue from [table one](#). Although the local agency program is fiscally constrained with the cost of the listed projects being less than the estimated revenue for the local agencies, numerous preservation and maintenance transportation projects are not currently identified by the BCATS implementing agencies. These agencies will fully utilize any and all existing dollars in attempts to maintain the existing transportation system. It is reasonably expected for local agencies to need more than \$180 million for capital projects over the life of this plan to adequately maintain the existing federal aid road system. The following scenarios on the Bay City asphalt roads will help identify this trend.



Bay City Federal Aid Asphalt Road Funding Scenarios

In an attempt to determine the amount of funding needed to maintain the existing transportation system, BCATS has utilized the asset management software, RoadSoft; along with road treatment cost estimates and existing surface conditions on the Bay City Federal Aid Asphalt Roads and ran several scenarios.

Scenario One uses the existing revenues estimates as identified in [table one](#). Scenario Two shows a cost-effective route to improve the transportation system by 2025. This scenario more than doubles the year expenditures on the Bay City asphalt road system. Both scenarios utilize the same “mix of fixes” approach to road treatment by providing the right fix at the right time to maximize the funds with the improvement to the Remaining

Service Life (RSL) of the road. The “mix of fixes” includes five different asphalt treatments that would be applied to a road at a specific point in its life span. They include crack sealing (\$4,800), chip seal (\$32,000), mill and overlay (\$150,000) crush and shape rehabilitation (\$342,000) and total reconstruction (\$600,000). These cost are in 2012 dollars per lane mile and are inflated by 3.3% per year through 2025.

Table 3: Asphalt Treatments

Asphalt Treatment	2012 Cost per Lane Mile	RSL before Treatment	RSL after Treatment
Total Reconstruction	\$600,031	< -10	15
Crush and Shape	\$342,395	-6	14
Mill & Overlay	\$150,000	-1	11
Sealcoat	\$32,000	3	7
Crack Seal	\$4,800	9	10

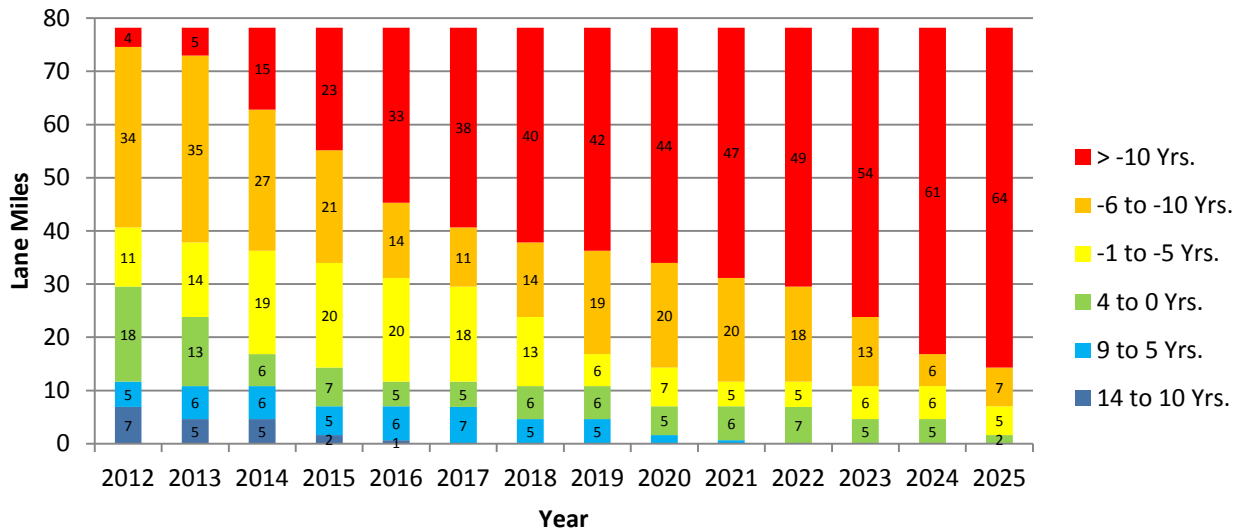
[Graph 1](#) on the following page shows the result of the annual RSL of the Bay City asphalt Federal Aid roads if the City utilizes their entire estimated Act 51 revenue only on the asphalt roads plus half of BCATS surface transportation funds. By 2025, the condition of the of those roads will continue to deteriorate to the point where 82% of those lane miles will be at least 10 years past their remaining service life (RSL) and only 2% will have a positive RSL. This would also put most, if not all, the 15.3 lane miles of concrete and sealcoat roads in poor condition as they would be neglected during this time frame.

[Graph 2](#), also on the next page, highlights the scenario of Bay City spending approximately \$2.25 million per year on asphalt roads. The result would produce only 15% of lane miles with a negative RSL all while costing \$31.7 million through 2025. However, between the years of 2015 and 2019, there are more than 20 lane miles (25% of asphalt roads) with an RSL at negative 10 or older, much higher than the 5% it is in 2012.



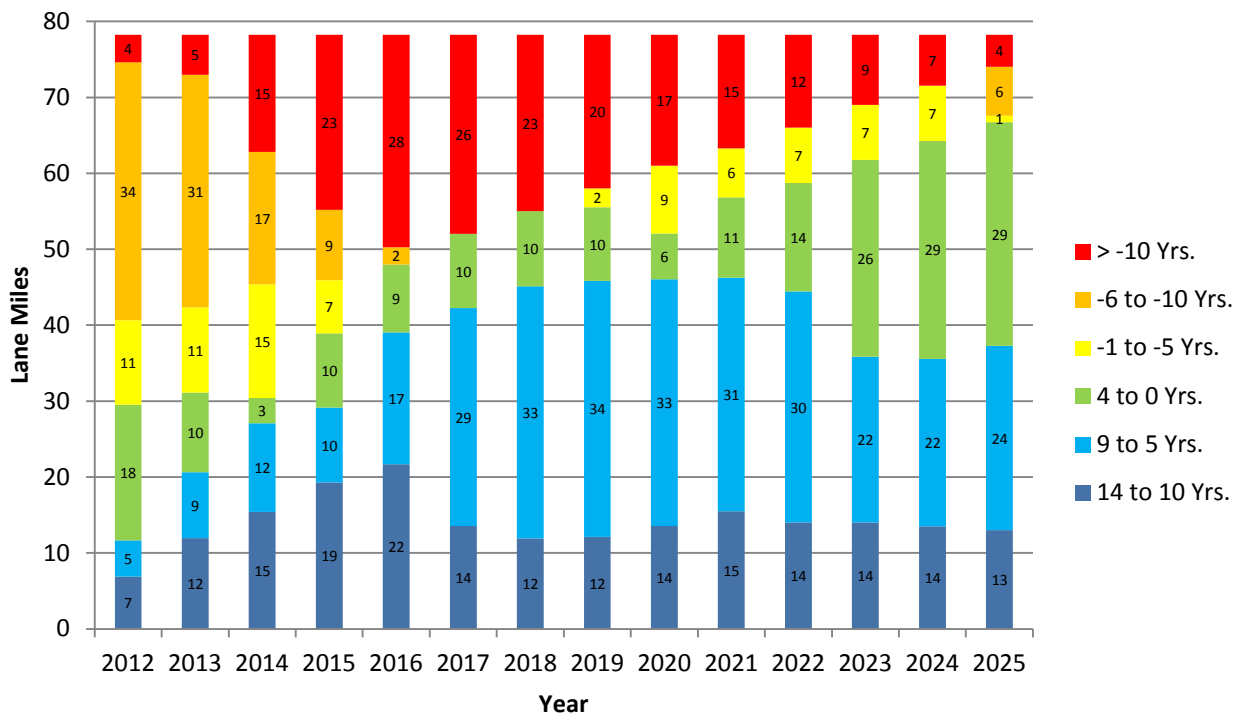
Graph 1: Remaining Service Life (RSL)

Scenario One: Current Revenue Estimates (\$15.6 million total)



Graph 2: Remaining Service Life (RSL)

Scenario Two: \$2.25 million per year average (\$31.7 million total)





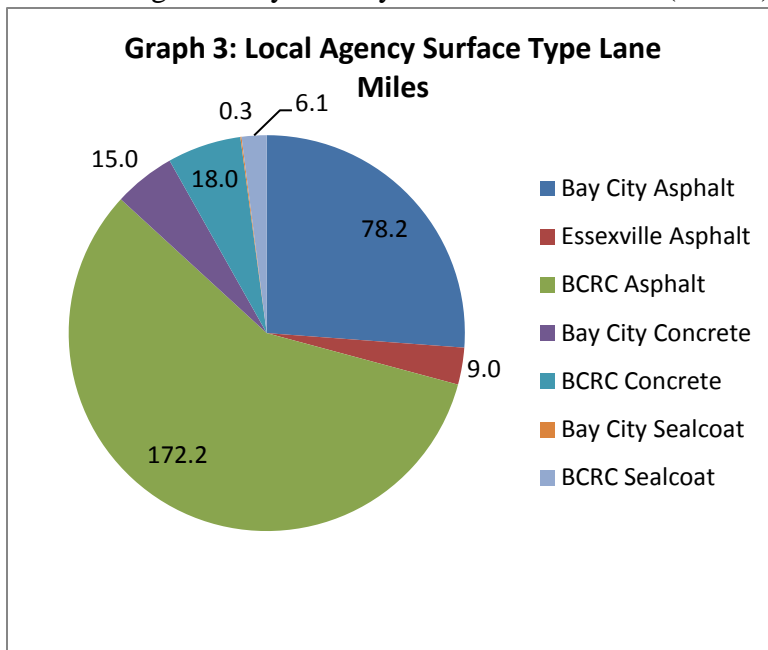
Summary of Bay City Asphalt Road Scenario

Bay City asphalt roads are only one slice of the transportation pie with BCATS and account for 26% (Graph 3) of all BCATS local agency lane miles. There are also concrete and sealcoat roads in Bay City as well as roads under other agencies including the Bay County Road Commission (BCRC), Essexville, and the Michigan Department of Transportation.

With Scenario Two costing \$31.7 million from 2012 to 2025 (13 years), the remaining 14 years (2026-2040) of this plan can be expected to cost around \$60 million to maintain the same road system over a similar time span while accounting for a 3.3% inflation rate.

The cost for maintaining this 26% of the BCATS local agencies Federal Aid Road System over the life of this plan totals \$91 million. If the assumption is made that this accounts for half of the cost to the roads system, as repairs in the city tend to run higher than repairs in the townships due to more utilities, higher population and employment densities, and traffic issues, then the total funds needed to just maintain the system in good repair would be \$182 million.

The total estimated revenues for Bay City roads plus half of the BCATS federal funds (the other half would be available for the BCRC and Essexville) is not enough to adequately maintain the Bay City asphalt roads. This shortfall applies similarly to the remainder of the system which will continue to deteriorate faster than repairs can be made without a substantial increase in funding.





MDOT Revenue Estimate

Table four (right), shows the 5-year estimates of future revenue for the MDOT expenditure within the entire BCATS rural and urban areas. Future estimates are based on the 2011 funding levels. No growth in revenues is expected for 2012 and 2013. Starting in 2014 a 2% increase is estimated through 2017. After 2017, the estimated yearly increase is 2.62%, bringing the 29 year total for MDOT to \$428 million. As MDOT currently has no identified projects in this plan, all the funding will go specifically to capital improvement over the 29 year plans. Future projects include more work on I-75 and US-10 as portions of those expressways are expected to reach the end of their life span during the timeframe of this plan. As these are high volume, high cost roads, it is expected that cost to maintain MDOT roads through 2040 within BCATS will exceed the estimated revenue by at least 50%, similar to the numbers shown by Bay City.

Table Four: MDOT Revenue Estimates

Estimates as of 4/10/2012	BCATS STUL Funds (Federal \$)	MDOT Trunkline Fund for BCATS
Lane Miles	298	338
Year		
2012-2016	\$7,454,262	\$47,776,208
2017-2021	\$8,428,637	\$47,529,739
2022-2026	\$9,747,484	\$57,256,454
2027-2031	\$11,248,394	\$74,209,405
2032-2036	\$12,956,499	\$101,916,748
2037-2040	\$11,752,432	\$99,188,834
Total	\$56,444,333	\$427,877,388

Although the plan is fiscally constrained, numerous transportation projects, mainly preservation and maintenance in nature, not currently identified by the BCATS implementing agencies will fully utilize any and all existing dollars to maintain the existing BCATS transportation system. The implementing agencies, with tighter and tighter budgets, find it difficult to match existing federal and state road construction funding. Without additional funding sources or increases to the existing funding sources improvements to the BCATS transportation network sufficient to maintain the system at its existing maintenance level will become impossible to achieve.

MDOT 2040 MPO Long Range Revenue Forecast Methodology

(March 28, 2012)

Highway Revenue Forecast Growth Rate

MDOT Statewide Transportation Planning Division analyzed historical state highway revenue and historical federal obligations. State revenue and federal obligation growth rates were calculated. The revenue growth used in the long range revenue forecast for the near term has virtually flat rates to reflect the current economic conditions. For some years the state forecast assumes additional revenue through a variety of mechanisms to match federal aid. In order to take a conservative approach with the federal and state revenue forecasts beyond the near term, 90% of the historic growth rates were used.



The resulting rates beyond the near term are: federal 2.6% annual growth, and state 2.3% annual growth.

Total estimated federal revenue: \$31.4 B

Total estimated state revenue: \$27.9 B

Revenue available for Capital outlay

Debt service, non-capital uses and routine maintenance are deducted from the estimated federal and state revenue. The resulting FY 2012-2040 total estimated revenue available for highway capital outlay is \$37.5 billion (in future year dollars).

Methodology for MPO Allocation of Capacity Improvement/New Road Dollars

The trunkline capacity improvement and new road (CI/NR) projects in the Long Range Revenue Forecast are in the 2012-2016 Five-Year Transportation Program, have earmarks or are on corridors of National Significance. They were reviewed and vetted by MDOT executive management. The revenue remaining after accounting for the CI/NR projects is available for the preservation program.

Methodology for MPO Allocation of Highway Program Preservation Dollars

A ten-year history (2002-2011) of highway capital program investments (excluding CI/NR) was compiled. Each MPO's share was calculated by dividing the MPO investment by the total statewide investment over the ten year time frame. Next the FY 2012-2040 total estimated revenue for preservation was multiplied by each MPO share of historic investments. The result is FY 2012-2040 total estimated revenue for preservation for each MPO.



Transit Revenue Estimates

Table Five: Transit Revenue Estimates				
Year	Federal Transit Funding	State Operating Funds	Locally raise revenue (millage, fare box, etc)	Total
2011 Base	\$1,381,516	\$2,805,630	\$3,697,000	\$7,884,146
2012	\$1,381,516	\$2,805,630	\$3,697,000	\$7,884,146
2013	\$1,381,516	\$2,805,630	\$3,697,000	\$7,884,146
2014	\$1,433,323	\$2,816,011	\$3,710,679	\$7,960,013
2015	\$1,487,072	\$2,826,430	\$3,724,408	\$8,037,911
2016	\$1,542,838	\$2,836,888	\$3,738,189	\$8,117,914
2017	\$1,600,694	\$2,847,384	\$3,752,020	\$8,200,098
2018	\$1,671,765	\$2,865,608	\$3,776,033	\$8,313,405
2019	\$1,745,991	\$2,883,947	\$3,800,200	\$8,430,138
2020	\$1,823,513	\$2,902,405	\$3,824,521	\$8,550,439
2021	\$1,904,477	\$2,920,980	\$3,848,998	\$8,674,455
2022	\$1,989,036	\$2,939,674	\$3,873,631	\$8,802,342
2023	\$2,077,349	\$2,958,488	\$3,898,423	\$8,934,260
2024	\$2,169,584	\$2,977,423	\$3,923,373	\$9,070,379
2025	\$2,265,913	\$2,996,478	\$3,948,482	\$9,210,873
2026	\$2,366,520	\$3,015,656	\$3,973,752	\$9,355,928
2027	\$2,471,593	\$3,034,956	\$3,999,184	\$9,505,733
2028	\$2,581,332	\$3,054,380	\$4,024,779	\$9,660,491
2029	\$2,695,943	\$3,073,928	\$4,050,538	\$9,820,408
2030	\$2,815,643	\$3,093,601	\$4,076,461	\$9,985,705
2031	\$2,940,658	\$3,113,400	\$4,102,551	\$10,156,608
2032	\$3,071,222	\$3,133,326	\$4,128,807	\$10,333,355
2033	\$3,207,585	\$3,153,379	\$4,155,231	\$10,516,195
2034	\$3,350,001	\$3,173,560	\$4,181,825	\$10,705,387
2035	\$3,498,742	\$3,193,871	\$4,208,588	\$10,901,201
2036	\$3,654,086	\$3,214,312	\$4,235,523	\$11,103,921
2037	\$3,816,327	\$3,234,884	\$4,262,631	\$11,313,841
2038	\$3,985,772	\$3,255,587	\$4,289,912	\$11,531,271
2039	\$4,162,741	\$3,276,423	\$4,317,367	\$11,756,530
2040	\$4,347,566	\$3,297,392	\$4,344,998	\$11,989,956
TOTAL	\$73,440,318	\$87,701,628	\$115,565,103	\$276,707,049

The other piece of the transportation funding pie is the funds to transit related activities including operation, capital improvement, and bus and van replacement. Table five (above) includes the estimated funds expected to be available for the Bay Metro Transit Authority (BMTA). The majority of these funds (State operating, and local revenue) go towards day to day operations of the bus routes and dial-a-ride service. The remainder is what is available for capital improvement including bus replacement, central bus station repairs and improvements, and life van replacement.



Table Six: Transit Fiscal Constraint Demonstration		Dollars (x1000)
Total Transit Available Funds		\$276,707
Operations and Maintenance Cost	-	\$207,121
Funds Available for Capital Projects		\$69,586
Metropolitan Transportation Plan Identified Projects	-	\$67,952
Available for unassigned Transit Projects		\$1,634

Table Six compares the local agency roads projects listed in [Chapter 5](#) with the estimated revenue from [table five](#). The transit program is fiscally constrained with the cost of the listed projects being less than the estimated revenue for the BMTA.